

IN THE CLAIMS

Please cancel claims 2-68 without prejudice.

1. (Once and presently amended) A method for removing oxygen contaminants from ammonia contaminated with oxygen, said method comprising the steps of contacting the oxygen contaminated ammonia with a getter oxygen removing material including consisting essentially of at least partially-reduced oxides of iron and manganese to sorb said oxygen contaminants from said contaminated ammonia, to produce thereby ammonia substantially free of oxygen.

Please add the following claims.

69. (New). A method for removing oxygen from ammonia comprising the steps of: thermally reducing hydroxides of iron and manganese to produce oxides of iron and manganese; reducing said oxides of iron and manganese to produce an ammonia purification material, such that said purification material includes at least partially-reduced oxides of iron and manganese; removing oxygen from an oxygen-contaminated ammonia stream with said purification material of iron and manganese, by contacting ammonia with said purification material, said removing step performed at less than 50C and greater than -20C.

70. (New) The method as recited in claim 69, further comprising a pretreatment step of adding zeolites.

71. (New) The method as recited in claim 69, wherein said reducing step takes place between 200 and 400 degrees C.

72. (New) The method as recited in claim 69, where said thermally reducing step takes place at 350 degrees C.

73. (New). The method as recited in claim 69, further comprising the act of pre-treating salts of iron and manganese to produce hydroxides of iron and manganese.

74. (new). A method of making a getter for removing oxygen contaminants from ammonia, said method comprising:

a step for pre-treating hydroxides of iron and manganese;

a step for decomposing said hydroxides of iron and manganese into oxides of iron and manganese, respectively; and

a step for exposing said oxides of iron and manganese first to a hydrogen stream and then to an argon stream resulting in said getter for removing oxygen,

wherein said getter is capable of removing oxygen from ammonia at temperatures below 50 degrees centigrade.

<LANGEI> Page. 1

=> fil hca
FILE 'HCA' ENTERED AT 13:08:52 ON 03 DEC 2004
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2004 AMERICAN CHEMICAL SOCIETY (ACS)

Copyright of the articles to which records in this database refer is held by the publishers listed in the PUBLISHER (PB) field (available for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications. The CA Lexicon is the copyrighted intellectual property of the American Chemical Society and is provided to assist you in searching databases on STN. Any dissemination, distribution, copying, or storing of this information, without the prior written consent of CAS, is strictly prohibited.

FILE COVERS 1907 - 25 Nov 2004 VOL 141 ISS 23
FILE LAST UPDATED: 25 Nov 2004 (20041125/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d que 147
L5 9 SEA FILE=REGISTRY ABB=ON PLU=ON (1304-28-5/BI OR
1305-78-8/BI
7439-96-5/B
I OR 7631-86-9/BI OR 7664-41-7/BI OR 7782-44-7/BI)
L6 1 SEA FILE=REGISTRY ABB=ON PLU=ON L5 AND AMMONIA/CN
L7 1 SEA FILE=REGISTRY ABB=ON PLU=ON L5 AND OXYGEN/CN
L8 1 SEA FILE=REGISTRY ABB=ON PLU=ON L5 AND MANGANESE/CN
L9 1 SEA FILE=REGISTRY ABB=ON PLU=ON L5 AND IRON/CN
L10 350262 SEA FILE=HCA ABB=ON PLU=ON L6 OR AMMONIA OR NH3
L12 555126 SEA FILE=HCA ABB=ON PLU=ON L8 OR MANGANESE OR MN
L13 1216275 SEA FILE=HCA ABB=ON PLU=ON L9 OR IRON OR FE
L14 1898750 SEA FILE=HCA ABB=ON PLU=ON L7 OR OXYGEN OR O2 OR O
L22 21957 SEA FILE=HCA ABB=ON PLU=ON L10(L) (PUR OR PREP) /RL
L23 114798 SEA FILE=HCA ABB=ON PLU=ON L14(L) (REM OR PROC) /RL
L24 165 SEA FILE=HCA ABB=ON PLU=ON L22 AND L23
L25 11 SEA FILE=HCA ABB=ON PLU=ON L24 AND L12
L27 35 SEA FILE=HCA ABB=ON PLU=ON L24 AND L13
L28 40 SEA FILE=HCA ABB=ON PLU=ON L25 OR L27
L29 6396 SEA FILE=HCA ABB=ON PLU=ON L10 AND L14 AND (L12 OR L13)
L37 357 SEA FILE=HCA ABB=ON PLU=ON L10(5A) (DEOXYGENAT? OR
(?SORB? OR
REMOV?) (3A) L14)

L38 52 SEA FILE=HCA ABB=ON PLU=ON L29 AND (CONTAMIN? OR
IMPUR?) (4A)

L14

L40 44 SEA FILE=HCA ABB=ON PLU=ON L37 AND L29
L41 95 SEA FILE=HCA ABB=ON PLU=ON L40 OR L38
L42 126 SEA FILE=HCA ABB=ON PLU=ON L41 OR L28
L43 10458 SEA FILE=HCA ABB=ON PLU=ON L14 (L) REM/RL
L44 30 SEA FILE=HCA ABB=ON PLU=ON L43 AND L42
L45 23 SEA FILE=HCA ABB=ON PLU=ON L44 AND L13
L46 5295 SEA FILE=HCA ABB=ON PLU=ON L7 (L) REM/RL
L47 15 SEA FILE=HCA ABB=ON PLU=ON L46 AND L45

=> fil wpix

FILE 'WPIX' ENTERED AT 13:09:30 ON 03 DEC 2004

COPYRIGHT (C) 2004 THE THOMSON CORPORATION

FILE LAST UPDATED: 25 NOV 2004 <20041125/UP>

MOST RECENT DERWENT UPDATE: 200476 <200476/DW>

DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

>>> FOR A COPY OF THE DERWENT WORLD PATENTS INDEX STN USER GUIDE,
PLEASE VISIT:

[<<<](http://www.stn-international.de/training_center/patents/stn_guide.pdf)

>>> FOR DETAILS OF THE PATENTS COVERED IN CURRENT UPDATES, SEE
[<<<](http://thomsonderwent.com/coverage/latestupdates)

>>> FOR INFORMATION ON ALL DERWENT WORLD PATENTS INDEX USER
GUIDES, PLEASE VISIT:
[<<<](http://thomsonderwent.com/support/userguides)

>>> NEW! FAST-ALERTING ACCESS TO NEWLY-PUBLISHED PATENT
DOCUMENTATION NOW AVAILABLE IN DERWENT WORLD PATENTS INDEX
FIRST VIEW - FILE WPIFV.
FOR FURTHER DETAILS: [<<<](http://www.thomsonderwent.com/dwpifv)

>>> NEW DISPLAY FORMAT HITSTR ADDED ALLOWING DISPLAY OF
HIT STRUCTURES WITHIN THE BIBLIOGRAPHIC DOCUMENT <<<

>>> SMILES and ISOSMILES strings are no longer available as
Derwent Chemistry Resource display fields <<<

=> d que 149

L48 64 SEA FILE=WPIX ABB=ON PLU=ON AMMONIA(5A) (DEOXYGENAT? OR
(?SORB? OR REMOV?) (3A) OXYGEN)

L49 5 SEA FILE=WPIX ABB=ON PLU=ON L48 AND (MANGANESE OR IRON)

<LANGEI>Page 3

=> fil compendex

FILE 'COMPENDEX' ENTERED AT 13:10:06 ON 03 DEC 2004

Compendex Compilation and Indexing (C) 2004

Elsevier Engineering Information Inc (EEI). All rights reserved.

Compendex (R) is a registered Trademark of Elsevier Engineering Information Inc.

FILE LAST UPDATED: 22 NOV 2004 <20041122/UP>

FILE COVERS 1970 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN
THE BASIC INDEX >>>

=> d que 150

L48 64 SEA FILE=WPIX ABB=ON PLU=ON AMMONIA(5A) (DEOXYGENAT? OR
(?SORB? OR REMOV?) (3A) OXYGEN)

L50 1 SEA FILE=COMPENDEX ABB=ON PLU=ON L48 AND (MANGANESE OR
IRON)

=> fil jicst

FILE 'JICST-EPLUS' ENTERED AT 13:10:44 ON 03 DEC 2004

COPYRIGHT (C) 2004 Japan Science and Technology Agency (JST)

FILE COVERS 1985 TO 22 NOV 2004 (20041122/ED)

THE JICST-EPLUS FILE HAS BEEN RELOADED TO REFLECT THE 1999 CONTROLLED TERM (/CT) THESAURUS RELOAD.

=> d que 52

'52' IS NOT VALID HERE

For an explanation, enter "HELP DISPLAY QUERY".

=> d que 152

L52 2 SEA FILE=JICST-EPLUS ABB=ON PLU=ON
AMMONIA(5A) (DEOXYGENAT?
OR (SORB? OR REMOV?) (3A) OXYGEN)

=> dup rem 147 149 150 152

FILE 'HCA' ENTERED AT 13:12:41 ON 03 DEC 2004

USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.

PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

COPYRIGHT (C) 2004 AMERICAN CHEMICAL SOCIETY (ACS)

FILE 'WPIX' ENTERED AT 13:12:41 ON 03 DEC 2004

COPYRIGHT (C) 2004 THE THOMSON CORPORATION

FILE 'COMPENDEX' ENTERED AT 13:12:41 ON 03 DEC 2004
Compendex Compilation and Indexing (C) 2004
Elsevier Engineering Information Inc (EEI). All rights reserved.
Compendex (R) is a registered Trademark of Elsevier Engineering
Information Inc.

FILE 'JICST-EPLUS' ENTERED AT 13:12:41 ON 03 DEC 2004
COPYRIGHT (C) 2004 Japan Science and Technology Agency (JST)
PROCESSING COMPLETED FOR L47
PROCESSING COMPLETED FOR L49
PROCESSING COMPLETED FOR L50
PROCESSING COMPLETED FOR L52
L54 22 DUP REM L47 L49 L50 L52 (1 DUPLICATE REMOVED)

=> dis 154 1-22 ibib abs hitind

L54 ANSWER 1 OF 22 HCA COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 141:73674 HCA
TITLE: Methods for regenerating process gas purifier
materials
INVENTOR(S): Torres, Robert; Vininski, Joseph; Lawrence, David
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 19 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|----------|
| US 2004123736 | A1 | 20040701 | US 2003-651644 | 20030828 |
| PRIORITY APPLN. INFO.: | | | US 2002-407124P | P |

AB A continuous method of producing a process fluid gas from a feed stream comprising the process fluid and impurities is provided, comprising:
(a) providing a first and second vessel, each vessel containing one or more regenerable purifier materials for removing at least one of said impurities from said feed stream; (b) removing at least one of said impurities by passing said feed stream through one or the other of said vessels to provide said purified process fluid gas, said vessel being maintained at a first temperature during said removal of said at least one of

said impurities; and (c) regenerating said one or more purifier materials

in each of said vessels at a second temperature and during the a time when it is

not purifying said feed stream by flowing a portion of said purified process fluid or said feed stream or a sep. source of said process fluid

gas therethrough. The process fluids to be purified may be a hydride such

as ammonia, a hydrocarbon, halocarbon, an oxide of nitrogen, a halogenated

fluid, a sulfur-containing fluid, or an amine. At least one of said purifier

materials is an alloy or oxide of V, Mo, Sb, Bi, Sn, Ce, Cr, Co, Cu, W,

Fe, Mn, Ni, Zr, Hf, Nb, Ta, Tc, Os, Rh, Ir, Ag, Cd, Hg
or mixts. thereof. The impurities able to be removed by this process include: moisture, carbon dioxide, siloxanes, germane, silane, hydrogen

sulfide, oxygen, carbon monoxide and tetraethoxysilane. The invention is

particularly applicable to the purification of ammonia as a process gas for

semiconductor manufacturing

IC ICM B01D053-02

NCL 095116000; 095148000; 095133000

CC 48-1 (Unit Operations and Processes)

Section cross-reference(s): 67, 76

IT 1304-76-3, Bismuth oxide, uses 1306-19-0, Cadmium oxide, uses 1313-96-8, Niobium oxide 1313-99-1, Nickel oxide, uses 1314-23-4, Zirconium oxide, uses 1314-35-8, Tungsten oxide, uses 1314-61-0, Tantalum oxide 1327-33-9, Antimony oxide 1332-29-2, Tin oxide 1332-37-2, **Iron** oxide, uses 1344-70-3, Copper oxide 7439-88-5D, Iridium, alloys **7439-89-6D, Iron, alloys**

7439-96-5D, Manganese, alloys 7439-97-6D, Mercury, alloys 7439-98-7D, Molybdenum, alloys 7440-02-0D, Nickel, alloys 7440-03-1D, Niobium, alloys 7440-04-2D, Osmium, alloys 7440-16-6D, Rhodium, alloys 7440-22-4D, Silver, alloys 7440-25-7D, Tantalum, alloys 7440-26-8, Technetium, uses 7440-26-8D, Technetium, alloys 7440-31-5D, Tin, alloys 7440-33-7D, Tungsten, alloys 7440-36-0D, Antimony, alloys 7440-43-9D, Cadmium, alloys 7440-45-1D, Cerium, alloys 7440-47-3D, Chromium, alloys 7440-48-4D, Cobalt, alloys 7440-50-8D, Copper, alloys 7440-58-6D, Hafnium, alloys 7440-62-2D, Vanadium, alloys 7440-67-7D, Zirconium, alloys 7440-69-9D,

Bismuth,

alloys 11098-99-0, Molybdenum oxide 11099-11-9, Vanadium oxide 11104-61-3, Cobalt oxide 11118-57-3, Chromium oxide 11129-18-3,

Cerium

oxide 11129-60-5, **Manganese** oxide 12055-23-1, Hafnium oxide 12645-46-4, Iridium oxide 12653-71-3, Mercury oxide 12680-36-3, Rhodium oxide 20667-12-3, Silver oxide 20816-12-0, Osmium oxide
 RL: CAT (Catalyst use); USES (Uses)

(methods for regenerating process gas purifier materials and application to semiconductor device fabrication processes)

IT 7664-41-7P, **Ammonia**, preparation 7704-34-9DP, Sulfur, compds.

RL: PUR (Purification or recovery); PREP (Preparation)

(methods for regenerating process gas purifier materials and application to semiconductor device fabrication processes)

IT 78-10-4, Tetraethoxysilane 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes 7732-18-5, Water, processes
7782-44-7, Oxygen, processes 7782-65-2, Germane
 7783-06-4, Hydrogen sulfide, processes 7803-62-5, Silane, processes

RL: REM (Removal or disposal); PROC (Process)

(methods for regenerating process gas purifier materials and application to semiconductor device fabrication processes)

L54 ANSWER 2 OF 22 WPIX COPYRIGHT 2004 THE THOMSON CORP on STN
 ACCESSION NUMBER: 2004-374908 [35] WPIX

DOC. NO. CPI: C2004-140936

TITLE: Purification of ammonia comprises contacting a crude ammonia with purification agent such as **manganese** oxide and metal oxide as effective component.

DERWENT CLASS: E35 J01

INVENTOR(S): ARAKAWA, S; IKEDA, T; KASAYA, T; OTSUKA, K

PATENT ASSIGNEE(S): (NIPI-N) NIPPON PIONICS CO LTD; (ARAK-I) ARAKAWA S; (IKED-I) IKEDA T; (KASA-I) KASAYA T; (OTSU-I) OTSUKA

K

COUNTRY COUNT: 3

PATENT INFORMATION:

| PATENT NO | KIND | DATE | WEEK | LA | PG |
|---------------|------|----------|-----------|----|----|
| US 2004091413 | A1 | 20040513 | (200435)* | | 17 |
| JP 2004142987 | A | 20040520 | (200435) | | 22 |
| CN 1498853 | A | 20040526 | (200458) | | |

APPLICATION DETAILS:

| PATENT NO | KIND | APPLICATION | DATE |
|---------------|------|-----------------|----------|
| US 2004091413 | A1 | US 2003-691697 | 20031024 |
| JP 2004142987 | A | JP 2002-309134 | 20021024 |
| CN 1498853 | A | CN 2003-1101744 | 20031022 |

PRIORITY APPLN. INFO: JP 2002-309134 20021024

AN 2004-374908 [35] WPIX

AB US2004091413 A UPAB: 20041125

NOVELTY - An ammonia is purified by contacting a crude ammonia with purification agent such as **manganese** oxide and metal oxide as effective component. The metal oxide can be vanadium oxide, chromium oxide, tin oxide, zirconium oxide, bismuth oxide, niobium oxide, or tantalum oxide. The ratio of number of **manganese** atom to entire metallic atoms of the effective component is 80 to 99%.

USE - For purifying an **ammonia** to **remove** impurities e.g. **oxygen**, carbon monoxide, carbon dioxide or moisture, from crude ammonia.

ADVANTAGE - The inventive process utilizes purification agent that

may be reproduced without reducing its capability of removing impurities

in crude ammonia.

DESCRIPTION OF DRAWING(S) - The drawing shows a schematic view of a

purification line to carry out the inventive process.

Purification agent 1

Purification column 3

Numerical symbols 6, 7

Dwg. 1/3

L54 ANSWER 3 OF 22 WPIX COPYRIGHT 2004 THE THOMSON CORP on STN

ACCESSION NUMBER: 2004-111392 [12] WPIX

DOC. NO. NON-CPI: N2004-088713

DOC. NO. CPI: C2004-045437

TITLE: Adsorbent for removing water and/or other oxygen-containing impurities from fluid comprising ammonia in purification apparatus, comprises

compound,

e.g. ammonium sulfate, disposed within portion of

porous

substrate.

DERWENT CLASS: E35 E36 J01 L03 U11

INVENTOR(S): DONG, C C; RAO, M B; WU, D

PATENT ASSIGNEE(S): (AIRP) AIR PROD & CHEM INC; (DONG-I) DONG C C; (RAOM-I)

RAO M B; (WUDD-I) WU D

COUNTRY COUNT: 33

PATENT INFORMATION:

| PATENT NO | KIND DATE | WEEK | LA | PG |
|-----------|-----------|------|----|----|
|-----------|-----------|------|----|----|

| | | | | |
|------------|-----------------------------|--|--|--|
| EP 1380339 | A1 20040114 (200412)* EN 14 | | | |
|------------|-----------------------------|--|--|--|

| |
|---|
| R: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LT LU |
|---|

LV

MC MK NL PT RO SE SI SK TR
US 2004009873 A1 20040115 (200412)
KR 2004005641 A 20040116 (200434)

APPLICATION DETAILS:

| PATENT NO | KIND | APPLICATION | DATE |
|---------------|------|----------------|----------|
| EP 1380339 | A1 | EP 2003-14475 | 20030702 |
| US 2004009873 | A1 | US 2002-191719 | 20020709 |
| KR 2004005641 | A | KR 2003-45963 | 20030708 |

PRIORITY APPLN. INFO: US 2002-191719 20020709

AN 2004-111392 [12] WPIX

AB EP 1380339 A UPAB: 20040218

NOVELTY - An adsorbent (50) for removing water from a fluid comprising ammonia, comprises a substrate having pores and a surface area that is 100-2500 m²/g; and a compound disposed within a portion of the substrate.

The compound comprises cation(s) from e.g. ammonium (I) or lithium (I),

that is ionically associated with an anion from halide, sulfide, sulfite

or sulfate.

DETAILED DESCRIPTION - An adsorbent for removing water from a fluid

comprising ammonia, comprises a substrate having pores and a surface area

that is 100-2500 m²/g; and a compound disposed within a portion of the substrate. The compound comprises cation(s) from ammonium (I), lithium (I), sodium (I), potassium (I), cesium (I), magnesium (II), calcium (II),

strontium (II), barium (II), **manganese** (II), nickel (II), **iron** (II), zinc (II), aluminum (III), indium (III), **iron** (III) and/or zirconium (IV), that is ionically associated with an anion

from halide, sulfide, sulfite or sulfate. INDEPENDENT CLAIMS are also included for:

(a) an purification apparatus (10) for removing water from ammonia

comprising the adsorbent;

the (b) preparation of an adsorbent comprising providing a mixture comprising cation(s) and anion; impregnating a porous substrate with

at mixture to form an adsorbent; and heating the adsorbent precursor to

least 100 deg. C in a gaseous atmosphere to form the adsorbent; and

the
water contained within the fluid is at a partial pressure of 10-9 to 9
multiply 10-4 atm by passing the fluid over an adsorbent comprising
10-80
40 - 70
40 - 70
deg. C.
USE - For removing water and/or other oxygen-containing
impurities
from a fluid comprising ammonia in purification apparatus (claimed).
ADVANTAGE - The adsorbent purifies ammonia to the ppb level, has
high
sorption capacity and faster sorption kinetic, operates effectively at
ambient temperatures, can avoid the introduction of additional
contaminants to ammonia during the purification process, and requires
fewer process steps to manufacture, and has lower activation
temperatures.

DESCRIPTION OF DRAWING(S) - The figure is a purification
apparatus

that contains an adsorbent.

Purification apparatus 10

Fluid inlet 20

Chamber 30

Fluid outlet 40

Adsorbent 50

Inlet valve 60

Outlet valve 70

Dwg.1/2

L54 ANSWER 4 OF 22 COMPENDEX COPYRIGHT 2004 EEI on STN

ACCESSION NUMBER: 2004(19):2109 COMPENDEX

TITLE: Application of coagulation and conventional
filtration

in raw water pretreatment before microfiltration
membranes.

AUTHOR: Sakol, Dorota (PKE S.A. Lagisza Power Plant Water
and

Chemical Department, Bedzin 42-504, Poland);
Konieczny, Krystyna

SOURCE: Desalination v 162 n 1-3 Mar 10 2004 2004.p 61-73

CODEN: DSLNAH ISSN: 0011-9164

PUBLICATION YEAR: 2004

DOCUMENT TYPE: Journal

TREATMENT CODE: Application; Experimental

LANGUAGE: English

AN 2004(19):2109 COMPENDEX

AB Two step coagulation using **iron** coagulant (FeCl3) with anionic

polyelectrolyte in the first step and aluminum coagulant in the second one

was made to reduce the negative effect of the fouling phenomenon. The process was operated on the commercial scale. The raw water was the blowdown water from the power plant cooling system. The dead-end microfiltration units provided with 0.2 μm polypropylene membranes produced about 210 m^3/h of water. The results of statistical tests show a

significant difference between the concentrations of turbidity, total hardness, sulfates (VI), total **iron**, aluminum, silica, nitrate nitrogen, **ammonia** nitrogen, **oxygen** consumption and **absorbance** (254 nm) in the water during the whole process. The results of previous observations showed that the formation of the cake layer had been the main reason for the fouling phenomenon occurring on the

investigated membranes. It is significant that 75% of the suspension has

been removed during the pretreatment stages. The hydrobiological observations show the presence of Bacillariophyceae and Cyanophyta. It is

possible to remove them during the coagulation and prefiltration stages.

The investigation results show that it is possible to protect the polypropylene membrane from fouling occurring inside the membrane pores as

well as the formation of the cake layer. The use of a hybrid process combining the traditional raw water pretreatment with a membrane process

may be well-founded. ©CPY Elsevier B.V. All rights reserved. 16 Refs.

L54 ANSWER 5 OF 22 HCA COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 138:355691 HCA

TITLE: Materials and methods for the purification of inert,

INVENTOR(S): nonreactive, and reactive gases

Robert, Jr. Watanabe, Tadaharu; Fraenkel, Dan; Torres,

PATENT ASSIGNEE(S): Matheson Tri-Gas, Inc., USA

SOURCE: PCT Int. Appl., 25 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|-------|----------|-----------------|----------|
| ----- | ----- | ----- | ----- | ----- |
| WO 2003037484 | A1 | 20030508 | WO 2002-US35006 | 20021030 |

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,
CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE,
GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,
LR,
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM,
PH,
PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT,
TZ,
UA, UG, UZ, VN, YU, ZA, ZM, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ,
BY,
KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES,
FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ,
CF,
CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG
US 2003094098 A1 20030522 US 2002-284423 20021029
US 6824589 B2 20041130

PRIORITY APPLN. INFO.: US 2001-336327P P
20011031 US 2002-284423 A

20021029

AB Regenerable gas purifier materials are provided capable of reducing the

level of **contaminants** such as **oxygen** and water in an inert, nonreactive or reactive gas streams to parts-per-billion levels or

sub-parts-per-billion levels. The purifier materials comprise a thin layer of one or more reduced forms of a metal oxide coated on the surface

of a nonreactive substrate. The thin layer may further contain the completely reduced form of the metal.

IC ICM B01D053-02

CC 48-3 (Unit Operations and Processes)

IT 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes

1333-74-0, Hydrogen, processes 2551-62-4, Sulfur fluoride (SF6)
7439-90-9, Krypton, processes 7440-01-9, Neon, processes

7440-37-1,

Argon, processes 7440-63-3, Xenon, processes 7446-09-5, Sulfur dioxide, processes 7446-11-9, Sulfur trioxide, processes

7727-37-9,

Nitrogen, processes 7732-18-5, Water, processes **7782-44-7**,
Oxygen, processes 7783-06-4, Hydrogen sulfide (H2S), processes
7783-54-2, Nitrogen fluoride (NF3) 10024-97-2, Nitrogen oxide (N2O),
processes 10043-92-2, Radon, processes 10102-43-9, Nitric oxide,

processes 10102-44-0, Nitrogen dioxide, processes 10544-72-6,
Nitrogen

oxide (N2O4) 13827-32-2, Sulfur oxide (SO) 53238-43-0, Sulfur
oxide
(S2O2)

RL: **REM (Removal or disposal):** PROC (Process)

(regenerable materials and methods for the purification of inert,
nonreactive, and reactive gases)

IT 1304-76-3, Bismuth oxide, uses 1313-99-1, Nickel oxide (NiO), uses
1314-23-4, Zirconia, uses 1314-35-8, Tungsten oxide, uses
1327-33-9,

Antimony oxide 1332-29-2, Tin oxide 1332-37-2, **Iron** oxide,
uses 1344-28-1, Alumina, uses 1344-70-3, Copper oxide 7440-44-0,
Carbon, uses 7631-86-9, Silica, uses **7664-41-7**,
Ammonia, uses 11098-99-0, Molybdenum oxide 11104-61-3, Cobalt
oxide 11118-57-3, Chromium oxide 11129-18-3, Cerium oxide
11129-60-5, **Manganese** oxide 13463-67-7, Titania, uses
16833-27-5, Oxide 159995-97-8, Aluminum silicon oxide

RL: **TEM (Technical or engineered material use):** USES (Uses)

(regenerable materials and methods for the purification of inert,
nonreactive, and reactive gases)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR
THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE
FORMAT

L54 ANSWER 6 OF 22 HCA COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 135:48211 HCA

TITLE: System and method for purifying and distributing
chemical gases

INVENTOR(S): Udischas, Richard; Xu, Mindi; Schnepper, Carol;
Paganessi, Joseph

PATENT ASSIGNEE(S): Air Liquide SA pour l'Etude et l'Exploitation des
Procedes Georges Claude, Fr.

SOURCE: PCT Int. Appl., 32 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---------------|------|----------|-----------------|----------|
| ----- | ---- | ----- | ----- | ----- |
| WO 2001045819 | A1 | 20010628 | WO 2000-US41439 | 20001024 |

CN,
HR,
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,
CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM,

LT, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS,
RU, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO,
VN, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ,
YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH,
CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF,
BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG
US 6395064 B1 20020528 US 1999-426875 19991026
PRIORITY APPLN. INFO.: US 1999-426875 A
19991026

AB Distribution system vaporizes and purifies a liquefied gas from bulk tank
to produce ultrapure chemical gases for user station. Bulk tank is in flow

communication with a vaporization purification bed that generates the ultrapure

chemical gas, which is subsequently routed to buffer tank, before passage to

the user station. The pressure and temperature in vaporization purification bed are

controlled so that droplets formed by a spray nozzle evaporate very rapidly

and are converted into gas, while impurities in the liquid are left behind

in the form of solid particles.

IC ICM B01D019-00

CC 48-1 (Unit Operations and Processes)

Section cross-reference(s): 47, 76

IT 74-82-8, Methane, processes 630-08-0, Carbon monoxide, processes

7439-89-6, Iron, processes 7440-02-0, Nickel,

processes 7440-23-5, Sodium, processes 7440-43-9, Cadmium, processes

7440-47-3, Chromium, processes 7440-50-8, Copper, processes 7440-66-6,

Zinc, processes 7723-14-0, Phosphorus, processes 7727-37-9, Nitrogen,

processes **7782-44-7, Oxygen**, processes

RL: POL (Pollutant); REM (Removal or disposal); OCCU (Occurrence); PROC (Process)

(system and method for purifying and distributing chemical gases)

IT 2551-62-4P, Sulfur hexafluoride 7647-01-0P, Hydrogen chloride, uses

7664-41-7P, Ammonia, uses 10024-97-2P, Nitrous oxide,

uses 10035-10-6P, Hydrogen bromide, uses

RL: **PUR (Purification or recovery);** TEM (Technical or engineered material use); **PREP (Preparation);** USES (Uses)

(system and method for purifying and distributing chemical gases)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE REFORMAT

L54 ANSWER 7 OF 22 HCA COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 132:154019 HCA

TITLE: Purification of **ammonia**

INVENTOR(S): Miyano, Yasusada; Otsuka, Kenji; Waki, Hiroshi

PATENT ASSIGNEE(S): Japan Pionics, Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|----------|
| ----- | ---- | ----- | ----- | ----- |
| JP 2000044228 | A2 | 20000215 | JP 1998-217168 | 19980731 |
| PRIORITY APPLN. INFO.: | | | JP 1998-217168 | |

19980731

AB In **removing** of **O**, **CO**, and **CO2** from **NH3** by **Ni** catalysts, a H-containing gas is generated by treating **NH3** with its decomposition catalysts under heating in order to regenerate the **Ni** catalyst

used above. The decomposition catalyst may contain **Ni**, **Fe**, **Ru**, **Pd**, and/or **Pt**. The process is useful for H- and N-supplying-free regeneration

IC of **Ni** catalysts and useful for semiconductor manufacturing
ICM C01C001-02

CC ICS B01J023-72; B01J023-90; B01J038-10

CC 49-8 (Industrial Inorganic Chemicals)

ST Section cross-reference(s): 76

ST **ammonia** purifn nickel catalyst regeneration; decompn
ammonia hydrogen regeneration catalyst

IT Catalysts

Decomposition catalysts

Purification

Semiconductor device fabrication

(regeneration of **Ni** catalyst by H from catalytic decomposition of **NH3** in purification of **Ni** catalytic purification of **NH3** for **removing** of **O**, **CO**, and **CO2** for semiconductor manufacturing)

IT 7439-89-6, **Iron**, uses 7440-02-0, **Nickel**, uses 7440-05-3, **Palladium**, uses 7440-06-4, **Platinum**, uses 7440-18-8,

Ruthenium, uses

RL: CAT (Catalyst use); USES (Uses)

(regeneration of Ni catalyst by H from catalytic decomposition of **NH3** in purification of Ni catalytic purification of **NH3** for removing of O, CO, and CO2 for semiconductor manufacturing)

IT 1333-74-0P, Hydrogen, preparation

RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical

process); PREP (Preparation); PROC (Process)

(regeneration of Ni catalyst by H from catalytic decomposition of **NH3** in purification of Ni catalytic purification of **NH3** for removing of O, CO, and CO2 for semiconductor manufacturing)

IT 7664-41-7P, Ammonia, preparation

RL: PUR (Purification or recovery); PREP (Preparation)

(regeneration of Ni catalyst by H from catalytic decomposition of **NH3** in purification of Ni catalytic purification of **NH3** for removing of O, CO, and CO2 for semiconductor manufacturing)

IT 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes

7782-44-7, Oxygen, processes

RL: REM (Removal or disposal); PROC (Process)

(regeneration of Ni catalyst by H from catalytic decomposition of **NH3** in purification of Ni catalytic purification of **NH3** for removing of O, CO, and CO2 for semiconductor manufacturing)

L54 ANSWER 8 OF 22 HCA COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 130:129222 HCA

TITLE: Process and apparatus for removal of nitrogen trifluoride from waste gases

INVENTOR(S): Jinbo, Takashi; Yasutake, Takeshi; Harada, Isao; Wachi, Hiroko

PATENT ASSIGNEE(S): Mitsui Chemicals Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|----------|
| JP 11019471 | A2 | 19990126 | JP 1997-174476 | 19970630 |
| PRIORITY APPLN. INFO.: | | | JP 1997-174476 | |
| 19970630 | | | | |

AB The title process comprises mixing NF₃- and O-containing waste gases with reducing gases after removing at least a part of O from the gases. The reducing gas may be H or **NH3**. The reaction may be carried out in the presence of catalysts such as **Fe**, Co, Ni, Cu,

Zn, Ru, Rh, Pd, Ag, Ir, Pt, and/or Au at 0-600°. The title apparatus has a waste gas inlet, an **O** separation unit, a reactor for reduction, and a unit to remove the F compds. generated. The process is useful for removal of NF3 from cleaning gases in semiconductor manufacturing

IC ICM B01D053-68
IC S B01D053-86

CC 59-4 (Air Pollution and Industrial Hygiene)
Section cross-reference(s): 47, 67, 76

ST nitrogen fluoride redn **oxygen** removal; catalyst redn nitrogen fluoride waste gas; semiconductor cleaning waste nitrogen fluoride redn;

IT reactor catalytic redn nitrogen fluoride removal
Reactors
(catalytic; removal of **O** before reduction of NF3 contained in waste gas with reducing gas (and catalyst))

IT Detoxification
Reduction
Reduction catalysts
Waste gases
(removal of **O** before reduction of NF3 contained in waste gas with reducing gas (and catalyst))

IT Semiconductor devices
(waste gas from cleaning of; removal of **O** before reduction of NF3 contained in waste gas with reducing gas (and catalyst))

IT 7439-88-5, Iridium, uses **7439-89-6, Iron**, uses
7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-16-6, Rhodium, uses 7440-18-8, Ruthenium, uses 7440-22-4, Silver, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses 7440-66-6, Zinc, uses
RL: CAT (Catalyst use); USES (Uses)
(removal of **O** before reduction of NF3 contained in waste gas with reducing gas (and catalyst))

IT 1333-74-0, Hydrogen, uses **7664-41-7, Ammonia**, uses
RL: NUU (Other use, unclassified); USES (Uses)
(removal of **O** before reduction of NF3 contained in waste gas with reducing gas (and catalyst))

IT **7782-44-7, Oxygen**, processes 7783-54-2, Nitrogen trifluoride
RL: **REM (Removal or disposal); PROC (Process)**
(removal of **O** before reduction of NF3 contained in waste gas with reducing gas (and catalyst))

L54 ANSWER 9 OF 22 HCA COPYRIGHT 2004 ACS on STN DUPLICATE 1
ACCESSION NUMBER: 126:227230 HCA
TITLE: Process and getter material for **removing oxygen** from flowing **ammonia** at room temperature

INVENTOR(S): Vergani, Giorgio; Succi, Marco; Solcia, Carolina
 PATENT ASSIGNEE(S): Saes Getters S.P.A., Italy
 SOURCE: PCT Int. Appl., 11 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|---|------|----------|-----------------|----------|
| WO 9706104 | A1 | 19970220 | WO 1996-IT158 | 19960802 |
| W: CN, JP, KR | | | | |
| RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, | | | | |
| PT, SE | | | | |
| US 5716588 | A | 19980210 | US 1996-686583 | 19960726 |
| EP 784595 | A1 | 19970723 | EP 1996-926569 | 19960802 |
| EP 784595 | B1 | 19980513 | | |
| R: BE, DE, FR, GB, IT, NL, SE | | | | |
| CN 1161031 | A | 19971001 | CN 1996-190860 | 19960802 |
| CN 1078871 | B | 20020206 | | |
| JP 10507735 | T2 | 19980728 | JP 1997-508285 | 19960802 |
| JP 3231781 | B2 | 20011126 | | |
| US 6776970 | B1 | 20040817 | US 1997-961792 | 19971031 |
| PRIORITY APPLN. INFO.: | | | IT 1995-MI1756 | A |
| 19950807 | | | | |
| 19960726 | | | US 1996-686583 | A1 |
| 19960802 | | | WO 1996-IT158 | W |

AB In this process, in which **O** is removed with a getter material at room temperature, the flowing **NH3** is contacted with a getter material consisting of a mixture of metallic **Fe** and **Mn** (sp. surface area $\sim 100 \text{ m}^2/\text{g}$) in weight ratio (1-7):1. The getter material

is supported on, e.g., zeolites, porous Al_2O_3 , porous SiO_2 , and other mol.

sieves. Addnl., the **NH3** is contacted with a drying agent selected from BaO , CaO , SrO , and zeolites 3A. The resulting **NH3** is especially suitable for use in semiconductor manufacture

IC ICM C01C001-02

CC 49-8 (Industrial Inorganic Chemicals)
Section cross-reference(s): 76

ST **iron manganese** powder **oxygen** getter;
semiconductor **ammonia** **oxygen** getter support; zeolite porous support **oxygen** getter; alumina porous support **oxygen** getter; silica porous support **oxygen** getter; mol sieve support **oxygen** getter; drying agent **oxygen**

getter **ammonia**; barium oxide drying agent; calcium oxide drying agent; strontium oxide drying agent

IT Getters
(**iron-manganese** powder; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT Drying agents
(process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT Semiconductor materials
(process and getter material for **removing oxygen** from flowing **ammonia** at room temperature for manufacture of)

IT Molecular sieves
(supports; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT Zeolites (synthetic), uses
RL: NUU (Other use, unclassified); USES (Uses)
(supports; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT 1304-28-5, Barium oxide, properties 1305-78-8, Calcia, properties
1314-11-0, Strontium oxide, properties
RL: PRP (Properties)
(drying agent; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT 7439-96-5, **Manganese**, properties
RL: PRP (Properties)
(powder, admixts. with **iron** powder; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT 7439-89-6, **Iron**, properties
RL: PRP (Properties)
(powder, admixts. with **manganese** powder; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT 7664-41-7P, **Ammonia**, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT 7782-44-7, **Oxygen**, processes
RL: REM (Removal or disposal); PROC (Process)
(process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

IT 1344-28-1, Alumina, uses 7631-86-9, Silica, uses
RL: NUU (Other use, unclassified); USES (Uses)
(supports, porous; process and getter material for **removing oxygen** from flowing **ammonia** at room temperature)

ACCESSION NUMBER: 127:250206 HCA
 TITLE: Method and apparatus comprising two alternating purifier beds for removing impurities from specialty gases at ambient temperatures
 INVENTOR(S): Carrea, Giovanni; Warrick, Brian D.; Wickman, Lewis J.
 PATENT ASSIGNEE(S): Ultrapure Systems, Inc., USA
 SOURCE: PCT Int. Appl., 16 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|--|------|----------|-----------------|----------|
| WO 9731699 | A1 | 19970904 | WO 1997-US3226 | 19970228 |
| W: AU, CA, CN, JP, KR, MX, RU, SG | | | | |
| RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE | | | | |
| US 5833738 | A | 19981110 | US 1996-609240 | 19960301 |
| AU 9719829 | A1 | 19970916 | AU 1997-19829 | 19970228 |
| PRIORITY APPLN. INFO.: 19960301 | | | US 1996-609240 | A |
| | | | WO 1997-US3226 | W |
| 19970228 | | | | |

AB The method comprises contacting the specialty gas with a purifier in a 1st

vessel and at the same time regenerating the purifier in a 2nd vessel.

The method and apparatus remove impurities from bulk-source specialty gases to

levels of <10 ppb. This system is suitable for purifying corrosive and

noncorrosive specialty gases. Depending on whether corrosive or noncorrosive gases are being purified and on the contaminants of concern,

the purification beds contain an absorber and/or getter. Water and CO₂ are

removed from, e.g., NH₃, using a bed of zeolite 13X.

IC ICM B01D053-04

CC 49-8 (Industrial Inorganic Chemicals)

ST gas purifn zeolite alloy getter; **iron** tin zirconium alloy getter; ammonia purifn zeolite alloy getter; water carbon dioxide ammonia

purifn

IT 7664-41-7P, Ammonia, preparation

RL: PUR (Purification or recovery); PREP (Preparation)

(method and apparatus comprising two alternating purifier beds for removing

impurities from specialty gases at ambient temps.)

IT 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes

7782-44-7, Oxygen, processes

RL: **REM (Removal or disposal); PROC (Process)**

(method and apparatus comprising two alternating purifier beds for removing

impurities from specialty gases at ambient temps.)

L54 ANSWER 11 OF 22 HCA COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 123:323970 HCA

TITLE: The impurity processing system for the JET Active Gas

Handling System - inactive commissioning

AUTHOR(S): Lupo, J.; Hemmerich, J. L.; Lasser, R.;
Yorkshades,

J.; Salanave, J. L.

CORPORATE SOURCE: JET Joint Undertaking, Abingdon, Oxfordshire, OX14
3EA, UK

SOURCE: Fusion Technology (1995), 28(3, Pt. 2), 1347-52

CODEN: FUSTE8; ISSN: 0748-1896

PUBLISHER: American Nuclear Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The Impurity Processing (IP) system is designed to recover tritium from

tritiated compds. (Q_2O , $CxQy$, NQ_3 , with $Q = H, D, T$ and $x \geq 1$, $y \geq 4$) collected from the JET torus or generated during the processing of gases inside the Active Gas Handling System (AGHS). The recovery process involves dilution of the **impurities** in helium, addition of **oxygen**, recirculation of the helium-**impurities** -**oxygen** mixture over a hot recombiner (773 K) to generate water and CO_2 , and trapping of the water on 160 K cold surfaces. The remaining

gas species He, CO_2 , **O₂**, N_2 (with a very small tritium concentration) are transferred finally to the Exhaust Detritiation (ED) system for further reduction of the tritium concentration by at least a factor of 1000. The

cold trap is heated (473 K) and the water vapor passed over two hot **iron** beds at 823 K to "crack" the water. The recovered hydrogen isotopes are stored in cold uranium beds (U-beds) for further processing

in AGHS.

CC 71-2 (Nuclear Technology)

IT **7439-89-6, Iron, uses 7440-61-1, Uranium, uses**

RL: NUU (Other use, unclassified); USES (Uses)

(beds; impurity processing system for the JET tokamak Active Gas Handling System)

IT 74-82-8, Methane, processes 558-20-3, Methane (CD4) 676-95-9, Methane-t4 **7664-41-7**, **Ammonia**, processes 7727-37-9, Nitrogen, processes **7782-44-7**, **Oxygen**, processes 7789-20-0, Water-d2 13550-49-7, **Ammonia** (ND3) 14940-65-9, Water (T2O) 15070-37-8, **Ammonia**, t3

RL: **REM (Removal or disposal); PROC (Process)**

(**impurity** processing system for the JET tokamak Active Gas Handling System)

L54 ANSWER 12 OF 22 JICST-EPlus COPYRIGHT 2004 JST on STN

ACCESSION NUMBER: 970106026 JICST-EPlus

TITLE: Studies on an air-fluidized-bed biofilm reactor system
by

dynamic models.

AUTHOR: TSUBONE TOSHIAKI
TAKAHASHI MASAHIRO
ISHII MASATOSHI

CORPORATE SOURCE: NKK Corp.
Minist. of Constr. Public Work. Res. Inst.

SOURCE: Nihon Suido Consult.

pp. 359-370. Journal Code: G0420B (Fig. 14, Tbl. 3, Ref.

12)

ISSN: 1341-5115

PUB. COUNTRY: Japan

DOCUMENT TYPE: Conference; Article

LANGUAGE: Japanese

STATUS: New

AB A mathematical model for the Air-Fluidized-Bed Biofilm Reactor (AFBBR) was

developed based on soluble BOD(S-BOD) removal rate, **ammonia** nitrogen **removal** rate, **oxygen** consumption rate and oxygen transfer rate. The calculated values agreed well with the measured

values. And then simulations were made to evaluate the effect of air feed

rate control on the AFBBR by using this model and following results were

obtained. Comparing with the constant and equal air feed to every stage of

AFBBR, 1) tapered aeration had no advantages and no disadvantages, 2) proportional air feed rate control was effective against the change in the

influent feed rate, but not effective against the change in the influent

concentration, 3) DO control was effective even when the DO was controlled

at only one stage of the AFBBR. And based on the results about the oxygen

consumption in this system, the value of the oxygen consumption per BOD

removal could be smaller than that of the activated sludge system especially when the S-BOD/Total-BOD(T-BOD) ratio was small. (author abst.)

L54 ANSWER 13 OF 22 HCA COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 122:224856 HCA

TITLE: Tritium purification via zirconium-**manganese**

-**iron** alloy getter St 909 in flow processes

AUTHOR(S): Baker, J. D.; Meikrantz, D. H.; Pawelko, r. J.; Anderl, R. A.; Tuggle, d. G.

CORPORATE SOURCE: Idaho Natl. Eng. Lab., EG and G Idaho, Inc., Idaho Falls, ID, 83415-7111, USA

SOURCE: Fusion Technology (1995), 27(2T), 8-13
CODEN: FUSTE8; ISSN: 0748-1896

PUBLISHER: American Nuclear Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A Zr-**Mn-Fe** alloy, St 909, was evaluated as a purifier in tritium handling, transport, and storage applications. High efficiency

removal of CH₄, CO, CO₂, **NH₃**, and **O₂** was observed at concns. of 0.1-1% in He. Gas streams at 100-5000 sccm were passed through

getters operated at 600-800°. On-getter residence times of 2 s were required to achieve >99% removal of these reactive impurities.

At this removal efficiency level, the individual impurity capacity of 100 g

of St 909 purifier at 800° was 0.59, 0.28, 0.19, 0.14 and 0.12 mol of CH₄, CO, CO₂, **O₂** and **NH₃**, resp. Hydrogen containing gasses; CH₄ and **NH₃**; were cracked on the purifier and the resultant elemental hydrogen was released. Only 8 ± 2 scc of H₂ were retained on 100 g of St 909 at 800°. These features suggest that this alloy can be employed as an efficient purifier for hydrogen isotopes

in inert gas, nitrogen, or perhaps even H, D, or T streams.

CC 71-6 (Nuclear Technology)

Section cross-reference(s): 56

ST tritium purifn St909 getter; zirconium **manganese iron** alloy getter tritium

IT 74-82-8, Methane, processes **7664-41-7, Ammonia**, processes

RL: RCT (Reactant); REM (Removal or disposal); PROC (Process); RACT (Reactant or reagent)

(reactive impurities; evaluation of St 909 as a purifier in tritium handling, transport, and storage applications)

IT 124-38-9, Carbon dioxide, processes 630-08-0, Carbon monoxide, processes

7782-44-7, Oxygen, processes

RL: REM (Removal or disposal); PROC (Process)

(reactive impurities; evaluation of St 909 as a purifier in tritium handling, transport, and storage applications)

L54 ANSWER 14 OF 22 HCA COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 121:259089 HCA

TITLE: Low-cost process for generating controlled atmospheres

for heat-treating furnaces from noncryogenically produced impure nitrogen

INVENTOR(S): Epting, Michael J.

PATENT ASSIGNEE(S): Air Products and Chemicals, Inc., USA

SOURCE: U.S., 10 pp.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------|------|----------|-----------------|----------|
| US 5322676 | A | 19940621 | US 1992-995656 | 19921222 |
| CA 2111498 | AA | 19940623 | CA 1993-2111498 | 19931215 |

PRIORITY APPLN. INFO.: US 1992-995656

19921222

AB The process comprises mixing noncryogenically produced N containing 0.05-5.0

volume% residual O with excess reducing gas, e.g., H, NH₃, a C-, H-, and ≥ 1 O-containing hydrocarbons selected from alcs., ethers, aldehydes, ketones, Me₂CO, etc., passing the mixture at 100-950° through an NH₃ dissociator containing a Ni and/or Fe catalyst to convert the residual O into moisture, CO, and CO₂, and using the resultant gaseous mixture for annealing and heat-treating ferrous and nonferrous metals and alloys, brazing metals and

ceramics, sealing glass to metal, and sintering metal and ceramic powders.

IC ICM C01B021-04

NCL 423351000

CC 49-1 (Industrial Inorganic Chemicals)

Section cross-reference(s): 55, 57

ST controlled atm heat treating furnace; **oxygen** removal nitrogen controlled atm; hydrogen **oxygen** removal nitrogen; **ammonia oxygen removal** nitrogen; hydrocarbon **oxygen** removal nitrogen; methanol **oxygen** removal nitrogen; copper alloy annealing controlled atm; gold alloy annealing controlled atm; carbon steel annealing controlled atm

IT Controlled atmospheres
(manufacture of, from noncryogenically produced **impure** nitrogen, **oxygen** removal in, by combustion, for annealing and heat-treating operations)

IT Alcohols, reactions
Aldehydes, reactions
Ethers, reactions
Ketones, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(removal with, of **oxygen**, from noncryogenically produced nitrogen, for controlled atms. for annealing and heat-treating operations)

IT 7727-37-9P, Nitrogen, preparation
RL: PREP (Preparation)
(**oxygen** removal from noncryogenically produced, by combustion, for controlled atms. for annealing and heat-treating operations)

IT **7782-44-7, Oxygen, uses**
RL: **REM (Removal or disposal)**; PROC (Process)
(removal of, from noncryogenically produced nitrogen, by combustion,
for controlled atms. for annealing and heat-treating operations)

IT 67-56-1, Methanol, reactions 67-64-1, Acetone, reactions
1333-74-0,
Hydrogen, reactions **7664-41-7, Ammonia**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(**removal** with, of **oxygen**, from noncryogenically produced nitrogen, for controlled atms. for annealing and heat-treating operations)

L54 ANSWER 15 OF 22 HCA COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 123:61165 HCA
TITLE: Sulfur and **oxygen** removal from semi water gas
INVENTOR(S): Wei, Xionghui
PATENT ASSIGNEE(S): Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 8 pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|--|----------|-----------------|----------|
| CN 1087110 | A | 19940525 | CN 1992-112970 | 19921116 |
| PRIORITY APPLN. INFO.: | | | CN 1992-112970 | |
| 19921116 | | | | |
| AB | A solution of ferrous salt in an HOAc- NH3 buffer containing Fe ³⁺ is used for the removal of S and O from semi water gas. The solution may also be used to remove S in urea and ammonium bicarbonate manufacture | | | |
| IC | ICM C10K001-10 | | | |
| CC | 51-20 (Fossil Fuels, Derivatives, and Related Products) | | | |
| ST | semi water gas sulfur removal; oxygen removal semi water gas | | | |
| IT | Fuel gases (water gas, semi; iron salt solns. in acetic acid- ammonia buffers for sulfur and oxygen removal from semi water gas) | | | |
| IT | 64-19-7, Acetic acid, uses 7439-89-6D, Iron , salts 7664-41-7, Ammonia , uses RL: NUU (Other use, unclassified); USES (Uses) (iron salt solns. in acetic acid- ammonia buffers for sulfur and oxygen removal from semi water gas) | | | |
| IT | 7782-44-7, Oxygen , processes 7783-06-4, Hydrogen sulfide, processes RL: REM (Removal or disposal); PROC (Process) (iron salt solns. in acetic acid- ammonia buffers for sulfur and oxygen removal from semi water gas) | | | |
| IT | 57-13-6, Urea, miscellaneous 1066-33-7, Ammonium bicarbonate RL: MSC (Miscellaneous) (iron salt solns. in acetic acid- ammonia buffers for sulfur and oxygen removal in urea manufacture) | | | |

L54 ANSWER 16 OF 22 JICST-EPlus COPYRIGHT 2004 JST on STN
 ACCESSION NUMBER: 930632814 JICST-EPlus
 TITLE: Water Treatment System and Water Quality Control at Aquarium.
 AUTHOR: IWAIZUMI TAKASHI
 CORPORATE SOURCE: Ebara-Infilco Co., Ltd.
 SOURCE: Kuki Chowa, Eisei Kogaku, (1993) vol. 67, no. 7, pp. 485-491. Journal Code: F0331A (Fig. 11, Tbl. 3, Ref. 4)
 CODEN: KCEKA6; ISSN: 0386-4081
 PUB. COUNTRY: Japan
 DOCUMENT TYPE: Journal; Commentary
 LANGUAGE: Japanese
 STATUS: New
 AB For breeding of aquatic life in an aquarium, it is a key point to create

an artificial environment which is suitable for the aquatic life.

Especially, it is important to keep temperature and quality of breeding

water in stable conditions. Recirculation systems with sand filters are

nowadays popular as breeding water treatment facilities for aquaria. They

can remove turbidity, nitrify **ammonia**, supply dissolved **oxygen** and **remove** algea or bacteria. The author summarizes recent technologies for the recirculation type breeding water

treatment facilities, sea water treatment facilities for make-up water conditioning and wastewater treatment facilities for aquaria. Some important equipment and materials for the facilities are also referred to.

(author abst.)

L54 ANSWER 17 OF 22 HCA COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 117:174549 HCA

TITLE: Purification of **ammonia** by using zirconium-vanadium-**iron** alloy

INVENTOR(S): Succi, Marco; Solcia, Carolina

PATENT ASSIGNEE(S): Saes Getters S.p.A., Italy

SOURCE: Eur. Pat. Appl., 6 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|----------|
| EP 484301 | A1 | 19920506 | EP 1991-830475 | 19911031 |
| EP 484301 | B1 | 19941012 | | |
| R: DE, FR, GB, NL | | | | |
| JP 04292413 | A2 | 19921016 | JP 1991-313165 | 19911101 |
| PRIORITY APPLN. INFO.: | | | IT 1990-21958 | A |
| 19901102 | | | | |

AB Impurity-containing **NH3** is passed through a Zr-V-**Fe** alloy at $>300^{\circ}$ for 10 min then cooled to $<150^{\circ}$ (a temperature at which there is no appreciable dissociation of **NH3**) to give a purified **NH3**.

IC ICM C01C001-02

CC 49-8 (Industrial Inorganic Chemicals)

ST **oxygen removal ammonia** alloy **sorbent**
; water removal **ammonia** alloy sorbent

IT Drying
(dewatering, of **ammonia**, heated **iron**

-vanadium-zirconium alloy for)
 IT 75846-81-0
 RL: USES (Uses)
 (heated, water and **oxygen removal** by, in
ammonia purification)
 IT 7664-41-7P, **Ammonia**, preparation
 RL: PUR (Purification or recovery); PREP (Preparation)
 (purification of, water and **oxygen removal** in,
 zirconium-vanadium-**iron** alloy for)
 IT 7782-44-7, **Oxygen**, miscellaneous
 RL: REM (Removal or disposal); PROC (Process)
 (**removal** of, from **ammonia**, heated **iron**
 -vanadium-zirconium alloy for)

L54 ANSWER 18 OF 22 HCA COPYRIGHT 2004 ACS on STN
 ACCESSION NUMBER: 104:112127 HCA
 TITLE: Manufacture of **oxygen**-free nitrogen
 INVENTOR(S): Iimura, Toshimitsu; Yamazaki, Norio; Minagawa,
 Isamu
 PATENT ASSIGNEE(S): Taiyo Sanso Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|------------------------|------|----------|-----------------|----------|
| JP 60166206 | A2 | 19850829 | JP 1984-19250 | 19840203 |
| PRIORITY APPLN. INFO.: | | | JP 1984-19250 | |

19840203
 AB **O**-free N₂ (<1 ppm **O**) is manufactured by addition of
NH₃ at equivalent amount in 4:3 (mol. ratio) **NH₃-O₂**
 in N₂ and oxidation (180-190°) of **NH₃** over a catalyst of
 15-85:15-85 (weight ratio) **Mn** oxide-spinel type crystal (e.g., V,
 Cr, **Fe**, Co, Ni, Cu, Zn, Mo, W, or Au).

IC ICM C01B021-04
 ICS B01J023-34; B01J023-68; B01J023-84

CC 48-1 (Unit Operations and Processes)
 Section cross-reference(s): 49

ST nitrogen manuf **oxygen** free; **oxygen** removal nitrogen
 manuf; **ammonia** oxidn catalyst nitrogen purifn; **manganese**
 oxide catalyst nitrogen purifn; spinel crystal catalyst nitrogen
 purifn

IT Spinel-type crystals
 (catalysts containing **manganese** oxide and, for **ammonia**
 oxidation, in nitrogen purification)

IT Oxidation catalysts
(**manganese** oxide-spinel crystal metals, for **ammonia**, in nitrogen purification)

IT Air
(nitrogen enrichment of, manufacture of **oxygen**-free nitrogen in, by **ammonia** oxidation)

IT **7439-89-6**, uses and miscellaneous 7439-98-7, uses and
and miscellaneous 7440-02-0, uses and miscellaneous 7440-22-4, uses
and miscellaneous 7440-33-7, uses and miscellaneous 7440-47-3, uses
and miscellaneous 7440-48-4, uses and miscellaneous 7440-50-8, uses
and miscellaneous 7440-62-2, uses and miscellaneous 7440-66-6, uses
miscellaneous
RL: USES (Uses)
(catalysts containing **manganese** oxide and, for oxidation of **ammonia**, in nitrogen purification)

IT **7439-96-5D**, oxides
RL: CAT (Catalyst use); USES (Uses)
(oxidation catalysts containing, for **ammonia**, in purification of nitrogen)

IT **7664-41-7**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of, catalysts for, in nitrogen purification)

IT 7727-37-9P, preparation
RL: PUR (Purification or recovery); PREP (Preparation)
(purification of, in **removal** of **oxygen**, by **ammonia** oxidation)

IT **7782-44-7**, uses and miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(**removal** of, in nitrogen purification, by **ammonia** oxidation)

L54 ANSWER 19 OF 22 HCA COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 93:222536 HCA
TITLE: Catalytic **ammonia** decomposition and the
removal of **oxygen** and water vapor
from nitrogen-hydrogen mixtures
AUTHOR(S): Zlatkov, P.
CORPORATE SOURCE: Bulg.
SOURCE: Khimiya i Industriya (1922-1988) (1980), (5),
214-15
DOCUMENT TYPE: CODEN: KINSAF; ISSN: 0368-5764
LANGUAGE: Bulgarian
AB **NH₃** is decomposed to N₂ + H₂ over an **Fe** catalyst at

680-700°. The **O₂** is removed by using a highly active Pd catalyst. H₂O and **NH₃** are removed with mol. sieve Ca5A. The catalyst is an Al₂O₃ carrier containing Fe₂O₃ 63.9, FeO 30.1, Al₂O₃ 4.0, K₂O 1.6, and S 0.4%. When **NH₃** containing 0.2-1% H₂O is decomposed a N₂ + H₂ mixture containing 0.0001 volume% **O₂** having a dew point of -75° is prepared

CC 49-1 (Industrial Inorganic Chemicals)
 ST hydrogen nitrogen prepn catalyst; **ammonia** decompn catalyst; **oxygen** removal; water vapor removal; **iron** catalyst
 IT Dissociation catalysts
 (**iron**, for **ammonia**)
 IT Catalysts and Catalysis
 (palladium, for **oxygen** removal from hydrogen-containing gases)
 IT 7439-89-6, uses and miscellaneous
 RL: CAT (Catalyst use); USES (Uses)
 (catalysts, for **ammonia** decomposition)
 IT 7440-05-3, uses and miscellaneous
 RL: CAT (Catalyst use); USES (Uses)
 (catalysts, for **oxygen** removal from hydrogen-containing gas)
 IT 7664-41-7, reactions
 RL: RCT (Reactant); RACT (Reactant or reagent)
 (decomposition of, with **iron** catalyst, **oxygen** and water removal in)
 IT 1333-74-0P, preparation 7727-37-9P, preparation
 RL: **PREP (Preparation)**
 (preparation of, by **ammonia** decomposition, **iron** catalyst for)
 IT 7782-44-7, uses and miscellaneous
 RL: **REM (Removal or disposal); PROC (Process)**
 removal of, from hydrogen-containing gases, palladium catalysts in)

L54 ANSWER 20 OF 22 HCA COPYRIGHT 2004 ACS on STN
 ACCESSION NUMBER: 87:123350 HCA
 TITLE: **Ammonia** combustion catalysts
 INVENTOR(S): Taura, Teruchika
 PATENT ASSIGNEE(S): Nippon Junsuiso Co., Ltd., Japan
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.
 CODEN: JKXXAF
 DOCUMENT TYPE: Patent
 LANGUAGE: Japanese
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

| PATENT NO. | KIND | DATE | APPLICATION NO. | DATE |
|-------------|------|----------|-----------------|----------|
| ----- | ---- | ----- | ----- | ----- |
| JP 52065192 | A2 | 19770530 | JP 1975-140950 | 19751125 |
| JP 55040052 | B4 | 19801015 | | |

PRIORITY APPLN. INFO.:

JP 1975-140950

19751125

AB Catalyst carriers made of alloys containing Cr and Ni are etch treated, then

coated with Pd and heated in H to give **NH3** combustion catalysts.

The catalysts have good durability and good catalytic activity, and the

combustion of **NH3**-air mixture produces N-H2O mixture containing no NOx.

Thus, a outer surface of SUS 42 (containing 20% Ni and 25% Cr) tube (outer

diameter 10, inner diameter 8, length 625 mm) was coated with an acid-resistant

resin, the tube was immersed 20 min in aqueous 10 weight % HCl solution at

70-80° to remove 13.04 weight % of the steel tube, the inner wall of the tube was electroplated with Pd from an electrolyte containing PdCl₂.2H₂O

3.7, Na₂HPO₄.12H₂O 100, (NH₄)₂HPO₄ 20, and benzoic acid 2.5g/L, and the

tube was heated at 750-850° for 30 min while H was passed through the tube to give a reaction tube having catalytic inner wall. The amount of

Pd in the tube was 0.16 weight %. Air containing 23.5 volume % **NH3** was

then passed through the tube (at 700-860°) at a space velocity (of product gas) of 20,000 h⁻¹: the **NH3**, NOx, and O in product gas were 0.5 volume %, O ppm, and ≤1.0ppm, resp.

IC B01J023-86

CC 67-1 (Catalysis and Reaction Kinetics)

Section cross-reference(s): 48

ST **ammonia** combustion catalyst; palladium catalyst **ammonia** combustion; **oxygen removal** catalyst **ammonia**

IT Air

(**oxygen removal** from, by combustion of **ammonia**, catalysts for)

IT Combustion catalysts

(palladium-leached **iron** alloy, for **ammonia** in air)

IT 37301-67-0

RL: RCT (Reactant); RACT (Reactant or reagent)

(catalyst manufacture from, for combustion of **ammonia**)

IT 7440-05-3, uses and miscellaneous

RL: CAT (Catalyst use); USES (Uses)

(catalysts, for combustion of **ammonia**)

IT **7664-41-7**, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(combustion of, palladium-leached alloy catalyst for)

IT **7782-44-7**, uses and miscellaneous

RL: **REM (Removal or disposal); PROC (Process)**
(removal of, from air by combustion of **ammonia**, catalyst for)

L54 ANSWER 21 OF 22 WPIX COPYRIGHT 2004 THE THOMSON CORP on STN
ACCESSION NUMBER: 1977-13792Y [08] WPIX
TITLE: Nitrogen oxides removal from gas also containing
sulphur
presence of
oxides and oxygen - by mixing with ammonia in
catalyst formed by supporting base metal component on
cation-exchanged synthetic zeolite.
DERWENT CLASS: E36 J01
PATENT ASSIGNEE(S): (TOFU) TOA NENRYO KOGYO KK
COUNTRY COUNT: 1
PATENT INFORMATION:

| PATENT NO | KIND DATE | WEEK | LA | PG |
|-------------|------------|-----------|----|----|
| JP 52004469 | A 19770113 | (197708)* | | |
| JP 58014251 | B 19830318 | (198315) | | |

PRIORITY APPLN. INFO: JP 1975-21339 19750221; JP
1976-58229 19770606
AN 1977-13792Y [08] WPIX
AB JP 52004469 A UPAB: 19930901
Synthetic zeolite (e.g. synthetic faujasite or synthetic mordenite) is
dealkalised to form hydrogen type synthetic zeolite containing alkali
metal of
0.2-0.6 equivalent pref. 0.2-0.4 equivalent, per gram-atom of
aluminium. Using
this as carrier, one or more base metal components (e.g. sulphate of
copper or **iron**, oxide of chromium or vanadium, etc.) are
supported on it by impregnation under conditions causing no
ion-exchange,
obtaining a catalyst.
The gas containing harmful nitrogen oxides is mixed with
ammonia, and the
mixed gas is contacted with the catalyst. The catalyst exhibits
excellent
activity and selectivity of long life at low temperature and high
space
velocity.

L54 ANSWER 22 OF 22 WPIX COPYRIGHT 2004 THE THOMSON CORP on STN
ACCESSION NUMBER: 1977-83153Y [47] WPIX
TITLE: Nitric oxide removal from nitrogen containing oxygen
and opt.

nickel, steam - by reduction with ammonia over copper,

manganese oxide catalyst.

DERWENT CLASS: E36 J01

PATENT ASSIGNEE(S): (FARH) HOECHST AG

COUNTRY COUNT: 1

PATENT INFORMATION:

| PATENT NO | KIND | DATE | WEEK | LA | PG |
|------------|------|----------|-----------|----|----|
| DE 2620378 | A | 19771117 | (197747)* | | |
| DE 2620378 | C | 19851121 | (198548) | | |

PRIORITY APPLN. INFO: DE 1976-2620378 19760508

AN 1977-83153Y [47] WPIX

AB DE 2620378 A UPAB: 19930901

Selective removal involves reduction of N oxides (I) with excess ammonia (II)

at 180-250 degrees C in the presence of a catalyst (III) consisting of a

homogeneous mixture of oxides of Cu, Ni and Mn, each in a weight ratio between

0.1 and 1, pref. 1:1:1.. Only a relatively slight (1.1-10, especially 1.1-2.4

fold) stoichiometric excess of (II) is needed.

The gas mixture contains 300-5000 ppm. (I), 0.5-5 volume % O and 0-3 volume

% steam. (III) can be used alone as pellets or as mixture of 2-40 weight %

(III) on an inert support. E.g. the NO content of a gas mixture was reduced

from 1000 to under 10 ppm. by reduction with (II) over (III) on alpha-alumina.

=>